

U.S.S.N. 10/511,121

International Application Filing Date: April 15, 2003

Section 371 (c) Date: March 28, 2005

AMENDMENT AND RESPONSE TO OFFICE ACTION

Amendment

In the Claims

1. (Currently amended) A method of lubricating two sliding surfaces, wherein the two sliding surfaces slide against each other and are in a device or machine,

wherein at least one surface is a charged surface, comprising administering between the two surfaces a lubricating composition,

wherein the lubricating composition comprises a graft copolymer comprising a polyionic backbone that has a net positive or negative charge at neutral pH and side chains, and an aqueous medium,

wherein the side chains are formed by a polymer consisting of a first monomer (A), wherein the polyionic backbone is formed by a polymer consisting of a second monomer (B),

wherein the polyionic backbone adsorbs onto the charged surface to produce a lubricated surface, wherein the side chains do not bind with the charged surface, and wherein the resulting lubricated surface has a lower friction coefficient between the lubricated surface and the second sliding surface than the coefficient of friction between the charged surface and the second sliding surface in the absence of the lubricating composition.

2. (Original) The method of claim 1, wherein the polyionic backbone is poly(cationic).

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3. (Previously presented) The method of claim 2, wherein the polyionic backbone is selected from the group consisting of nonpeptide polyamines, polyamino acids and polysaccharides having net positive charge at neutral pH.

4. (Original) The method of claim 3, wherein the polyionic backbone is poly-L-lysine.

5. (Original) The method of claim 1, wherein the polyionic backbone is poly(anionic).

6. (Original) The method of claim 5, wherein the polyionic backbone is a polyamino acid having net negative charge at neutral pH.

7. (Original) The method of claim 6, wherein the polyamino acid is poly(L-glutamic acid).

8. (Previously presented) The method of claim 1, wherein the side chains are poly(ethylene glycol) chains.

Claims 9- 10. (Canceled).

11. (Original) The method of claim 1, wherein the charged surface is a metal oxide.

12. (Currently amended) A device or machine comprising two sliding surfaces, wherein the two sliding surfaces slide against each other when in operation, wherein at least one surface is a lubricated surface, comprising a charged surface and a lubricating composition, wherein the lubricating composition comprises a graft copolymer comprising a polyionic backbone that has a net positive or negative charge at neutral pH and side chains, and an aqueous

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medium, wherein the polyionic backbone adsorbs onto the charged surface, wherein the side chains do not bind with the charged surface, and wherein the lubricated surface has a lower friction coefficient between the lubricated surface and the second sliding surface than the coefficient of friction between the charged surface and the second sliding surface in the absence of the lubricating composition.

13. (Previously presented) The device or machine of claim 12, wherein the graft copolymer is PLL-g-PEG.

14. (Previously presented) The device or machine of claim 12, wherein the charged surface is a metal oxide.

15. (Canceled)

16. (Previously presented) The method of claim 1, wherein the charged surface is oxidized silicon.

17. (Previously presented) The device or machine of claim 12, wherein the charged surface is oxidized silicon.

18. (Previously presented) The device or machine of claim 12, wherein the polyionic backbone is selected from the group consisting of nonpeptide polyamines, polyamino acids and polysaccharides having net positive charge at neutral pH.

Claims 19-20. (Canceled).

21. (Previously presented) The device or machine of claim 12, wherein the side chains are formed by a first polymer consisting of a first monomer (A), and

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wherein the polyionic backbone is formed by a second polymer consisting of a second monomer (B).

22. (Previously presented) The method of claim 1, wherein the side chains are neutral water-soluble polysaccharides.

23. (Original) The method of claim 22, wherein the neutral water-soluble polysaccharides comprise dextran.

24. (Previously presented) The device or machine of claim 12, wherein the side chains are neutral water-soluble polysaccharides.

25. (Original) The device or machine of claim 24, wherein the neutral water-soluble polysaccharides comprise dextran.